

## Claims

1. A radio communication method, comprising:
  - a step in which a first radio communication device sends communication time reservation request information addressed to a second radio communication device, in which a time slot when data will be transmitted to the second radio communication device is written;
  - a step in which the second radio communication device sends communication time reservation response information, in which notice of reception of the communication time reservation request information is added to the communication time reservation request information;
  - a step in which a third radio communication device which has received the communication time reservation request information from the first radio communication device or the communication time reservation response information from the second radio communication device or both stores the time slot written in the communication time reservation request information or the communication time reservation response information as a transmission prohibited time slot; and
  - a step in which the third radio communication device decides upon a time slot in which its own transmission and reception are possible, based on the stored transmission prohibited time slots.
- 25 2. The radio communication method according to claim 1,

wherein the third radio communication device prohibits transmission in all time slots written in the stored communication time reservation request information or the communication time reservation response information.

5 3. The radio communication method according to claim 1 or 2, wherein notice of the time slot is given in the form of a data-transmission start time and a data-transmission dedicated time.

4. The radio communication method according to claim 1, 10 wherein the first radio communication device transmits a communication request signal RTS including communication time reservation request information and the second radio communication device transmits a communication confirmation signal CTS including communication time reservation response 15 information.

5. The radio communication method according to claim 2, wherein the communication time reservation request information and the communication time reservation response information also includes the channel used for communication, 20 in which even when the time slot of data transmission recorded in the communication prohibition table is the same, the communication time reservation request and the data transmission are possible if the channel whereby the first radio communication device performs transmission is different 25 from information of communication prohibition table.

6. The radio communication method according to claim 1,  
further comprising:

a step in which the first radio communication device  
transmits data in the time slot of which the second radio  
5 communication device has been notified;

a step in which the second radio communication device  
detects collisions while receiving data;

a step in which the second radio communication device  
gives notice of the collision to the first radio communication  
10 device when the number of collisions is more than or equal to  
the prescribed number of times; and

a step in which when the first radio communication device  
receives the notification of collision, it transmits  
communication time reservation request information addressed  
15 to the second radio communication device, in which the time  
slot for transmitting data is set to be a time slot different  
from the previous one.

7. The radio communication method according to claim 1,  
further comprising:

20 a step in which the first radio communication device  
transmits data in the time slot of which the second radio  
communication device has been notified;

a step in which the second radio communication device  
detects collisions while receiving data;

25 a step in which the second radio communication device

gives notice of the collision to the first radio communication device when the number of collisions per unit time is more than or equal to a prescribed number of times;

a step in which when the first radio communication device  
5 receives the notification of collision, it requests the second radio communication device to give the time slots in which transmission is prohibited or a time slot in which transmission is permitted;

a step in which when the second radio communication device receives the request, it transmits the transmission prohibited time slots or a transmission-permitted time slot to the first radio communication device; and

a step in which the first radio communication device selects a time slot which satisfies the conditions prescribed  
15 by the transmission prohibited time slots or the transmission-permitted time slot received from the second radio communication device and notifies the second radio communication device of the time slot as communication time reservation request information.

20 8. The radio communication method according to claim 1, further comprising:

a step in which when the first radio communication device transmits the communication time reservation request information to the second radio communication device, the  
25 second radio communication device checks whether the

information overlaps with communication time reservation request information received from another radio communication device as a third radio communication device;

5 a step in which when the second radio communication device detects a collision, it adds information indicating the overlap to the communication time reservation response information;

a step in which the first radio communication device transmits data to the second radio communication device;

10 a step in which when the first radio communication device detects information indicating an overlap and detects that a response to data is not returned, this constitutes detection of a collision ;

15 a step in which when the number of collisions per unit time is more than or equal to the prescribed number, the first radio communication device inquires of the second radio communication device regarding the time when the first radio communication device does not collide; and

20 a step in which the first radio communication device transmits information of communication time reservation in accordance with the notification of the collision-free time slot made in response to the inquiry from the second radio communication device.

9. The radio communication method according to claim 1,  
25 further comprising:

a step in which when the transmission prohibited time slot decided based on communication time reservation request information or communication time reservation response information or both which are not addressed to the second radio communication device overlaps with a time slot in which communication addressed to the second radio communication device is reserved, the second radio communication device forwards communication time reservation request information and communication time reservation response information which are not addressed to it and which are received from that time onward, to radio communication devices in the transmittable area.

10. The radio communication method according to claim 1, further comprising:

15 a step in which the first radio communication device transmits data in the time slot of which notice has been given to the second radio communication device;

a step in which the second radio communication device detects collisions while receiving data;

20 a step in which the second radio communication device gives notice of the collision and of the transmission prohibited time slots or a transmission permitted time slot to the first radio communication device; and

25 a step in which when the first radio communication device receives the collision notification, it selects a time slot

which satisfies the conditions prescribed by the transmission prohibited time slots or the transmission-permitted time slot received from the second radio communication device and gives notice of the time slot satisfying the conditions to the second 5 radio communication device as communication time reservation request information.

11. The radio communication method according to any one of claims 6 to 10, wherein the second radio communication device detects that there has been a collision when data has not been 10 received in a time slot where the transmission prohibited time slot calculated based on the received communication time reservation request information or the communication time reservation response information or both which are not addressed to it, and the time slot reserved for communication 15 addressed to it overlap.

12. The radio communication method according to claim 7, wherein when the number of detected collisions is less than the prescribed number, the second radio communication device stops giving notice of its transmission prohibited time slots 20 or its transmission-permitted time slot.

13. The radio communication method according to claim 7, wherein when the ratio between the transmission prohibited time slot and the transmission-permitted time slot is no more than the prescribed value, the second radio communication device 25 stops giving notice of the transmission prohibited time slot

or the transmission-permitted time slot to the first radio communication device.

14. A radio communication device, comprising:

a receiving unit receiving radio communication data;

5 a communication data identification unit identifying the radio communication data including communication time reservation request information in which a time slot when a source radio communication device will transmit data is written, from the received radio communication data;

10 a communication information analysis unit extracting an identifier of the source radio communication device and the data transmission reservation time slot from the communication time reservation request information of the identified radio communication data,

15 a communication reservation table in which the communication information analysis unit records the identifier and reservation time slot, associating them with one another, when the destination of the radio communication data is the receiving radio communication device;

20 a response information generation unit generating communication time reservation response information in which information notifying that there will be proper transmission is added to the communication time reservation request information; and

25 a transmitting unit transmitting the generated

communication time reservation response information.

15. The radio communication device according to claim 14,  
further comprising:

a communication prohibition table in which the  
5 communication information analysis unit records the  
identifier, the reservation time slot and the destination,  
associating them with one another, when the radio communication  
device is not the destination of the radio communication data,  
and

10 wherein the response information generation unit  
generates communication time reservation response information  
to which the notice of communication prohibition is added when  
the received radio communication data addressed to it requests  
to reserve communication in a time slot which overlaps with  
15 a time slot recorded in the communication prohibition table.

16. The radio communication device according to claim 15,  
further comprising:

a communication data generation unit generating  
transmission data addressed to another radio communication  
20 device; and

a communication information generation unit generating  
communication time reservation request information including  
a transmission time slot, deciding on a time slot other than  
time slots recorded in the communication prohibition table as  
25 the transmission time slot for transmission of data generated

by the communication data generation unit, and  
wherein said transmitting unit transmits the  
communication time reservation request information to a  
destination radio communication device.

5 17. The radio communication device according to claim 16,  
further comprising:

an event timer, which notifies the communication data  
generation unit that the transmission time has elapsed when  
it receives the notification of the transmission time from the  
10 communication information generation unit, and

wherein when the communication data generation unit  
receives the notification, it generates communication data and  
transmits the data to the destination radio communication  
device.

15 18. The radio communication device according to claim 15,  
wherein the communication time reservation request  
information and the communication time reservation response  
information further includes information of a channel used for  
communication, and

20 wherein even when a time slot of data transmission  
recorded in the communication prohibition table by the  
communication information analysis unit is the same, the  
communication time reservation request and data transmission  
are possible when the channel by which the first radio  
25 communication device performs transmission is different from

the information of the communication prohibition table.